Dr. F. W. Dyson delivered the second discourse on "Greenwich Observatory and its Work."

A number of week-end excursions were made, and, owing largely to the beautiful, though unseasonable, weather, were all successful. The greater number of the excursionists were Overseas members, the Australian members being restricted largely to the official leaders and experts in what may be called "side-issues." Thus, a geological excursion would be accompanied by someone who could name plants, and so on.

About forty went by special train to Bacchus Marsh to inspect the Permo-Carboniferous glacials. Drs. Hall and Pritchard were the leaders, and Messrs. Sweet and Brittlebank, who discovered and worked out the beds, were present to help, and the main features were clearly seen.

The Surveyor-General, Mr. J. M. Reed, led a party by train and by coach over the dacite mountains to Marysville. Botanists, zoologists, and sightseers had a splendid, though somewhat arduous, time. Dr. C. S. Sutton and Mr. James Cuming, who was the host for the occasion, took a very large number by train to Warburton and Cement Creek. This is the home of big trees, though most of the giants have vanished. A visit was paid to the works of Messrs. Cuming, Smith and Co., where a number of chemical products from the eucalyptus are prepared on a fairly large scale. The naturalists revelled in the rich fern gullies with their wealth of zoological and botanical novelties.

A long day's excursion to the Macedon district was made possible by the generosity of the Automobile Club of Victoria, which provided cars. Prof. Skeats and Dr. Summers were the leaders, and the remarkable series of igneous rocks, for which the locality is famous, were well explored.

Prof. A. J. Ewart and Mr. R. Grimwade took a very large party by train along the narrow gauge track to Emerald. The mountain forest country was seen and large nurseries for raising fruit trees, and the Bosisto experimental oil-farm were visited. At the latter place, Messrs. Grimwade and Co. are cultivating scent plants, and have large experimental plantations of eucalyptus. Botanically, the excursion was a great success, as many typical Australian plants were seen.

A large party went by special train to Ballarat, the second city of the State. The mayors of the twin cities were most hospitable, and Mr. Wm. Baragwanath, the geological surveyor in charge of the district, demonstrated the leading features. The Government geologist, Mr. H. Herman, took another large party to Bendigo, where the famous "saddle" reefs were the chief source of attraction. The structure of the field was very clearly seen, and the lavish hospitality of the mayor and of the leading citizens was highly appreciated. Both here and at Ballarat, the plentiful loan of motor-cars made the inspection of wide areas of the surrounding country possible.

An excursion to the National Park at Wilson's Promontory, where 150 square miles of mountainous country is reserved as a sanctuary for animals and plants, had been planned by steamer. Almost at the last moment, the war troubles prevented the loan of the vessel. However, Mr. C. Catani, chief engineer of the Public Works Department, the leader, and especially Mr. J. A. Kershaw, curator of the National Museum, managed an overland transport, and the visit was thoroughly enjoyed by the small number who went.

Visits were paid to the Central Research Farm at Werribee under Dr. S. S. Cameron, Director of Agriculture, and to the Bacchus Marsh irrigated area under Dr. Elwood Mead.

Besides these official excursions, a large number were made under private guidance, and many special entertainments were given.

The meeting was, from all points, most successful; the Victorian members numbered 1998, and the details of organisation were under the control of Prof. Baldwin Spencer.

T. S. HALL.

## NOTES.

THE Research Defence Society has prepared an instructive leaflet upon the subject of protection against typhoid fever, dealt with by the honorary secretary of the society, Mr. Stephen Paget, elsewhere in the present issue of NATURE. The society sends out supplies of this leaflet, and makes arrangements for providing the treatment, free of charge. Application should be made to the hon. secretary, Research Defence Society, 21 Ladbroke Square, London, W.

IT is reported by a Reuter message from Smyrna that an earthquake which occurred at midnight on Saturday, October 3, partly destroyed the towns of Isbarta and Burdur in the province of Konia, Asia Minor.

THE death occurred on September 30, at eighty-eight years of age, of Sir Henry Littlejohn, late president of the Royal College of Surgeons, Edinburgh, professor of forensic medicine in the University of Edinburgh in the years 1897–1906, medical officer of health for Edinburgh from 1862 to 1908, and the author of many publications on legal medicine and public health.

THE attention of our readers may be usefully directed to the joint propaganda of the Fisheries Organisation Society and the National Deep Sea Protection Association. These bodies have issued a reprint of an article, by Mr. Stephen Reynolds, on fish-food in wartime, and a series of very practical recipes and hints on cooking and buying fish, in which particular attention is directed to the use of cured herrings and other fish. The Board of Agriculture and Fisheries also issue leaflets relating to the further utilisation of fish and salted herrings as food. It is very desirable that the propagandist efforts to which we refer should be made as widely known as possible. Deep-sea fishing is suffering severely from the restriction of the fishing grounds from actual war losses, and from the diversion of very many vessels and men to the dangerous task of mine-sweeping; and with very great loyalty the fishing trade in general has combined to keep prices as low as possible. The herring fisheries are suffering even more severely from the loss of their great continental markets for salted fish: it will be unfortunate in every way if the yield of this industry should be gravely diminished, and the only hope seems to be in the securing of the normal stock of pickled herrings for domestic use and future trade, by the State. The Fisheries Organisation Society is an outcome of the recently published report of the Inshore Fisheries Committee: it aims at the further development of the smaller sea and coastal fisheries by various methods. Its offices are at Queen Anne's Chambers, Tothill Street, Westminster. At no other time than the present could this organisation be of greater service to the country, and we hope that many of our readers may be inclined to make themselves acquainted with its work.

WE have received from Mr. Francis Edwards, of 83 High Street, Marylebone, W., a catalogue of "books about birds," together with a certain number of publications of learned societies, the whole comprising between two and three hundred items.

ACCORDING to the *Victorian Naturalist* for August, an attempt is to be made to introduce the lyre-bird into Tasmania. Mr. D. le Souëf, who was consulted in regard to the probable cost of the experiment, gave the opinion that the birds could be trapped for about 5*l.* per pair, adding that suitable food during the period of confinement could be supplied by the Melbourne Zoological Gardens.

FREE-SWIMMING nematode and littoral oligochæte worms from the salt Chilka Lake, on the Orissa coast of Bengal, form the subject of two articles, respectively by Dr. F. H. Stewart and Major J. Stephenson, in vol. x., part 4, of Records of the Indian Museum. All the four genera of the former group found in the lake-fauna are cosmopolitan, and for the most part marine types; but at least four of the Chilka species, referable to three genera, are regarded as new.

IN vol. ii., No. 5, of the *Austral Avian Record,* the editor, Mr. G. M. Mathews, makes further emendations in his list of Australian birds. Among these may be noted the creation of no fewer than a dozen new generic names for various long-established species. To many naturalists this will seem an altogether unnecessary proceeding, and, in any case, such inelegant and unwieldy compounds as Purnellornis, Alphachlamydera, Alphacincla, and the like, are to be deprecated.

To the October number of the *Museums Journal* Dr. F. A. Bather contributes an instructive article on museums and national service, in which special reference is made to the various branches of research work now carried on at the Natural History Branch of the British Museum. The amount of work of direct practical utility yearly accomplished there would, it is claimed, surprise even those familiar with that establishment, attention being also directed to the cosmopolitan character of these researches. At present the museum has not a health department, with special facilities for bacteriological work and the practical study of hygiene; but it is suggested that such an addition would form an important extension of the museum's already manifold functions.

IN connection with the above, reference may be made to an article in the same issue by Mr. F. Leney, of the Norwich Museum, on the insurance of museums and their contents against fire and damage from other causes. The article formed the subject of a paper read at the recent Museum Conference at Swansea, where an instructive discussion took place at the close of the reading. Metropolitan Government museums are, we believe, uninsured, and the matter relates, therefore, solely to local institutions. The usual practice, it appears, is to insure the buildings separately from the collections, and generally against fire alone. Loan collections are, however, habitually insured against risks of all kinds. In the discussion, Dr. Hoyle referred to the progressive appreciation in value of many objects in museums, and the consequent automatic under-insurance of collections.

BIRD-SKINS in museums, it appears, form a rich hunting-ground for students of bird-lice (Mallophaga), as those parasites are generally preserved with the skins of the birds they infest. Advantage of this has recently been taken in the Indian Museum, Calcutta, where the store-skins of game-birds and the crow-tribe have been carefully searched, and the dried parasites picked out. The latter were sent to Prof. V. L. Kellog, of Stanford University, California, by whom and his colleague, Mr. J. H. Paine, the collection is described in vol. x., part 4, of Records of the Indian Museum. That the bird-lice found in any individual kind of bird-skin are really native to that particular species, appears, in most cases at any rate, to be beyond doubt, and, as the result of their study of the Calcutta collection, the authors of the paper have felt themselves justified in describing no fewer than thirteen species as new.

THE subject of "glazed frost" is always interesting, owing to its somewhat rare occurrence, and possibly to some extent to the uncertainty of part of the physical process involved in its formation. The term is now generally adopted for the smooth coating of ice which covers objects, and is usually formed when rain, consisting of super-cooled water drops, strikes the ground or other objects, but may "very occasionally" be formed in other ways. To the Journal of the Meteorological Society of Japan for May last Dr. T. Okada contributes some useful notes on the phenomenon, and quotes cases of its occurrence in that country, together with detailed observations. His calculation shows that, in the case under consideration, "the conduction and evaporation of raindrops falling through ice-cold layers of the atmosphere will be sufficient to cool them many degrees below the freezing point." As pointed out elsewhere by Mr. E. Gold, the difficulty appears to be to explain why small drops do not solidify in falling through the air.

In the *Mathematical Gazette* for July (vi., 12), Prof. Harold Hilton proves that any twisted cubic curve may be displaced so that every point is moving perpendicular to its tangent, provided that the curve is screwed about a certain fixed axis.

The resistance of road vehicles to traction is commonly regarded as the sum of two parts, one due to rolling friction on the ground and the other due to sliding friction at the axle. In a recent note (Venice, Carlo Ferrari, 1914) reprinted from the *Atti del R. Istituto veneto,* lxxiii. (2), pp. 931–46, Prof. T. Levi Civita, by considering the conditions of equilibrium, establishes the interdependence of these two resistances, and obtains new formulæ determining the total resistance. The title of the paper is "Sforze di regime e sforze d'avviamento per veicoli trainati."

From the Department of Lands and Surveys of Western Australia we have received a copy of its "Geodetic Tables." This publication contains two tables, of which one gives the logarithms of the number of links in 1″ of latitude, and of longitude, and the other gives the logarithms of the seconds of the arc-versines of spheroidal arcs of parallels 1″ in length. In each case the tables cover the range of 50° from the equator southwards. The tables are based on the auxiliary tables of the Survey of India, the values for the additional ten degrees having been specially computed. A short introduction explains the method of using them, and they should be of use to land surveyors who wish to control their work by means of the triangulation stations of the department.

It was proved by Prof. Arnold Emch in the *American Journal of Mathematics* for October, 1913, that in every closed convex curve which is analytic throughout, at least one square can be inscribed. That at least one square can be circumscribed about such an oval curve is now proved by Prof. Tsuruichi Hayashi in the Bulletin of the American Mathematical Society, xx., 9, where he also obtains a parametric representation of the curve in tangential co-ordinates. His proof of the possibility of circumscribing the square about an oval curve is very simple. You can evidently circumscribe a rectangle having its sides parallel to any given direction. Now turn the direction round until the longer side becomes the shorter one. Then in some intermediate position the two sides will become equal, and the figure is then a square. It will be interesting and easy for mathematically inclined readers of Nature to reconstruct from this material a corresponding proof for the inscribed square if they have not seen Prof. Emch's paper.

In Yamagata, Japan, is a small lake called the Lake of the Floating Islands, discovered about the year 1340, which has from that time attracted the attention of many poets and literary men. A report on the mysterious movements of these islands drawn up by a party under Prof. S. Kusakabe is published in the Science Reports of the Tohoku Imperial University (Sendai), iii., 2. The floating islands, which at times number no fewer than sixty, are found to be continually changing their position, moving first one way and then the other. In the first series of observations, wooden floats were placed in the lake showing the distribution of the various currents; subsequently a model of the lake was constructed, and it was found possible closely to reproduce the various movements of the surface. When both water and wind currents were taken into account, the actual behaviour of the islands was found to be quite in accordance with theory and experiment. The islands originate from masses of vegetable *débris* which are first carried to the surface by bubbles of gas; then reeds commence to grow from seed on them; sometimes the mass becomes top-heavy and overturns, and reeds grow on the other side, until the island has grown sufficiently large in extent to secure stability.

The September number of *Terrestrial Magnetism and Atmospheric Electricity* contains reports of the work done by the magnetic survey ship *Carnegie* during her second cruise round the world and during a more recent journey from New York along the Gulf Stream to Hammerfest. Along the line of the latter route the values of the deviation of the compass to the west of true north were found to be in general greater than the values given in the British and American charts by amounts which reach 1·3° in the former and 2·2° in the latter chart. The atmospheric electric observations taken during the voyage round the world lead to the conclusion that over the sea the potential gradient is of the same order as that over land, the radio-activity is smaller, while the specific conductivity is larger, than that over land. The conductivity appears to be independent of the radio-activity, although, like the radio-activity, it is greater for air which has been in contact with land than for air which has not during the week before the observations on it are made

The Journal of the Washington Academy of Sciences for August 19 contains two interesting optical papers. The first, by Prof. P. G. Nutting, of the Eastman Research Laboratory, gives the results of a series of measurements of the focal length of the human eye for light of different wave-lengths within the visible spectrum. The author finds that while for a water lens the focal length increases by about 5 per cent. from the extreme blue to the red end of the spectrum at a rate which is fairly uniform, for many human eyes the increase, although of about the same amount, is confined to the ends of the range, the change over the middle half not exceeding 1 per cent., so that these eyes are nearly achromatic. The second, by Mr. F. E. Wright, of the Geophysical Laboratory, describes a new method of determining the refractive index of a mineral by the petrographic microscope. A stop below the condenser covers half the field, and its inverted image is formed between the stage and the low-power objective. In the same plane as this image a second stop is placed, and the distance of the edge of the second from that of the image of the first so adjusted that the field is nearly dark. In these circumstances, if a grain of mineral immersed in a liquid of refractive index not exactly equal with that of the mineral is placed on the microscope stage, the edges of the grain appear some brighter, some darker, than the field, and a liquid having the same refractive index as the mineral can be quickly chosen.

PRACTICAL methods of determining the critical loads for long struts of varying section have attracted some attention recently. The latest contribution to the subject is given in an article in *Engineering* for October 2 by Messrs. L. Bairstow and E. W. Stedman, of the National Physical Laboratory. The method described seems to be comparatively easy to apply, and has the advantage of being applicable with equal ease to the simplest or to the most general case. It was devised originally for finding the critical loads of wooden struts as used in aeroplane construction. An assumed critical load for the strut is guessed or obtained by an approximate method such as taking Euler's law for a uniform strut of the average section. Curves for $-d^2y/dx^2$, $dy/dx$ and $v$, which comply with the conditions imposed, are then drawn by a process of trial and error described in the article. If the assumed value of the critical load has happened to be correct, the ordinate of the $dy/dx$ curve becomes zero at the middle of the strut (for a strut hinged at both ends). If the assumed value has been incorrect, the ordinate becomes zero at some other point. After two attempts, a very close approximation to the value of the critical load is reached.

ERRATUM.—In NATURE of September 24, p. 95, col. i., for Dr. S. N. Shannus read Dr. H. S. Stannus.

## OUR ASTRONOMICAL COLUMN.

A NEW COMET.—The *Times* of October 3 publishes a telegram from South Africa announcing the discovery of a bright comet by Mr. Lunt at the Royal Observatory, Cape Town, on September 18. Mr. Wood, of Johannesburg, computed the orbit, and the following is the ephemeris given :—

| | Right Ascension<br>h. m. s. | Declination<br>° ′ |
|---|---|---|
| Oct. 1 | 22 48 48 | −26 44 |
| 5 | 22 23 36 | 17 41 |
| 9 | 22 8 44 | 11 11 |
| 13 | 21 59 24 | −6 34 |

Perihelion passage took place on August 5. While the comet is decreasing its southern declination and reaching a better position for observation in this country its brightness is stated to be fading fairly rapidly owing to the increasing distance from the sun. On October 9 the comet will be situated in the constellation of Aquarius, a little below the third magnitude star gamma.

The following elements, based by Mr. Wood on observations made on September 21, 24, and 27, have been since communicated by the Royal Astronomical Society :—

$$T = 1914 \text{ Aug. } 4{\cdot}99 \text{ G.M.T.}$$

$$\left.\begin{aligned} \omega &= 270^\circ\ 19' \\ \Omega &= \phantom{27}0^\circ\ 22' \\ i &= \phantom{2}77^\circ\ 51' \end{aligned}\right\} 1914{\cdot}0$$

$$\log q = 9{\cdot}8543$$

COMET 1913*f* (DELAVAN).—Delavan's comet is now badly situated for evening observation, so most should be made of the morning hours. The object is rapidly decreasing its northern declination and moving westward, and will pass perihelion on October 26. It is now situated in the constellation of Canes Venatici, and on October 10 will not be far from the third magnitude star, 12 Canes Venaticorum. The following eight-day ephemeris is taken from *Knowledge* for August last :—

| | Right Ascension<br>h. m. s. | Declination<br>° ′ |
|---|---|---|
| Oct. 10 | 12 56 44 | +38 56 |
| 18 | 13 37 56 | 32 57 |
| 26 | 14 11 50 | 26 45 |
| Nov. 3 | 14 40 44 | +20 40 |

THE RETURN OF ENCKE'S COMET.—The short-period comet known as Encke's comet, for he it was who first calculated its elements, although Pons, of Marseilles, actually discovered it in the sky, was due to return this autumn, its period being about three and one-third years. It is now reported (*Daily Telegraph*, October 2) that it has been observed from the Russian Observatory at Simeis in the Crimea, this information having been received from Prof. Backlund, the director of the Pulkovo Observatory. It is situated in the constellation of Perseus. Encke's comet is of historical interest for several reasons. It was only the second instance of the recognised return of a comet, Halley's comet having preceded it by sixty-three years. It was also the first example of a new class of celestial objects revolving round the sun within the orbit of Saturn and exhibiting certain planetary affinities in the manner of their motions.

ENHANCED LINES AND THE PRESENCE OF HYDROGEN.—No. 85 of the Contributions from the Mount Wilson Solar Observatory is devoted to some electric furnace experiments on the emission of enhanced lines in a hydrogen atmosphere. The author, Mr. A. S. King, used in this research the vertical Rowland grating spectrograph described in this column on September 24. The experiments included the production of the enhanced lines with the furnace in a partial vacuum and in hydrogen at varying pressures up to one atmosphere, and the use of greatly different amounts of titanium. After describing the details of the experiments Mr. King sums up his results in three brief but interesting paragraphs. The experiments failed to show any effect of a hydrogen atmosphere in strengthening enhanced lines. The enhanced lines appear in the furnace at low pressures with equal ease whether hydrogen is present or whether the furnace contains a residue of air. No material effect on the relative intensities of enhanced lines is indicated, even when widely differing amounts of titanium vapour at low pressure and at the same temperature are employed. Increasing the pressure of hydrogen, the temperature being held as nearly constant as possible, causes a progressive weakening of the titanium enhanced lines, until at atmospheric pressure only traces of the strongest are visible in the furnace spectrum. Mr. King finally directs attention to the bearing of these results on the study of stellar atmospheres and the value of the strength of enhanced lines as a criterion not only for stellar temperatures but for different regions and levels of the solar photosphere.

THE LEEDS ASTRONOMICAL SOCIETY.—Vol. xxi. of the Leeds Astronomical Society contains the Journal and Transactions for the past year. The volume is edited by Mr. C. T. Whitmell, and gives a good account of the activity of this society. At each of the seven meetings which took place a paper on some definite subject was read, and these are reproduced more or less in full in this report. Thus some of the contributions dealt with the spectroscope, Uranus as a view-point, history of astronomy, etc. Other work of the society is summed up in the latter part of the volume.